

AMENDMENTS TO THE CLAIMS

The listing of claims below replaces all prior versions of claims in the application.

1. (Currently Amended) A semiconductor device comprising:

a semiconductor substrate having a device region;

a transistor including a gate electrode formed in the device region with a gate insulation film formed therebetween; and

a metal layer formed over the gate electrode with an insulation film formed therebetween, formed of a metal material having the property of occluding hydrogen and having a peripheral part positioned outer of a region where the gate electrode and the device region overlap each other,

hydrogen termination of an interface between the semiconductor substrate and the gate insulation film by hydrogen annealing being suppressed, ~~the interface containing less hydrogen termination~~ so that a fluctuation of a dispersion of hydrogen termination ratio of the interface is not more than 35% of that without the metal layer when the transistor is of N channel, and a dispersion of hydrogen termination ratio of the interface is not more than 85% of that without the metal layer when the transistor is of P channel.

2. (Currently Amended) A semiconductor device comprising:

a semiconductor substrate having a first device region and a second device region;

a first transistor including a first gate electrode formed in the first device region with a first gate insulation film formed therebetween;

a second transistor forming a pair with the first transistor and including a second gate electrode formed in the second device region with a second gate insulation film formed therebetween;

a first metal layer formed over the first gate electrode with an insulation film formed therebetween, formed of a metal material having the property of occluding hydrogen and having a peripheral part positioned outer of a region where the first gate electrode and the first device region overlap each other; and

a second metal layer formed over the second gate electrode with the insulation film formed therebetween, formed of a metal material having the property of occluding hydrogen and having a peripheral part positioned outer of a region where the second gate electrode and the second device region overlap each other,

hydrogen termination of interfaces between the semiconductor substrate and the first and second gate insulation films by hydrogen annealing being suppressed, ~~the interfaces containing less hydrogen termination~~ so that a fluctuation of a dispersion of hydrogen termination ratio of the interfaces is not more than 35% of that without the first and the second metal layers when the first and second transistors are of N channel, and a dispersion of hydrogen termination ratio of the interfaces is not more than 85% of that without the first and the second metal layers when the first and second transistors are of P channel.

3. (Original) A semiconductor device according to claim 2, wherein the first metal layer and the second metal layer are electrically connected to each other.

4. (Original) A semiconductor device according to claim 1, wherein the potential of the metal layer is fixed to a prescribed potential.

5. (Previously Presented) A semiconductor device according to claim 2, wherein the potential of the first metal layer or the second metal layer is fixed to a prescribed potential.

6. (Original) A semiconductor device according to claim 1, wherein the potential of the metal layer is floating.

7. (Previously Presented) A semiconductor device according to claim 2, wherein the potential of the first metal layer or the second metal layer is floating.

8. (Previously Presented) A semiconductor device according to claim 1, wherein the ratio of a gap measured vertically between the semiconductor substrate and the metal layer to a gap measured horizontally between an edge of the region where the gate electrode and the device region overlap each other and the peripheral part of the metal layer is 0.32 or less than 0.32.

9. (Previously Presented) A semiconductor device according to claim 2, wherein the ratio of a gap measured vertically between the semiconductor substrate and the first metal layer to a gap measured horizontally between an edge of the region where the first gate electrode and the first device region overlap each other and the peripheral part of the metal layer is 0.32 or less than 0.32.

10. (Original) A semiconductor device according to claim 1, wherein the metal layer is formed of a layer film of a metal film formed of the metal material having the property of occluding hydrogen, and another metal film of a metal material which does not have the property of occluding hydrogen.

11. (Previously Presented) A semiconductor device according to claim 2, wherein the first metal layer or the second metal layer is formed of a layer film of a metal film formed of the metal material having the property of occluding hydrogen, and another metal film of a metal material which does not have the property of occluding hydrogen.

12. (Original) A semiconductor device according to claim 1, further comprising an interconnection layer formed on the insulation film and formed of the same metal film forming the metal layer.

13. (Previously Presented) A semiconductor device according to claim 2, further comprising an interconnection layer formed on the insulation film and formed of the same metal film forming the first metal layer or the second metal layer.

14. (Original) A semiconductor device according to claim 1, wherein the metal material is titanium, magnesium, an alloy containing titanium or an alloy containing magnesium.

15. (Original) A semiconductor device according to claim 1, wherein the transistor forms a part of a differential circuit or a part of current mirror circuit.

16-20. (Canceled)

21. (Previously Presented) A semiconductor device according to claim 9, wherein the ratio of a gap measured vertically between the semiconductor substrate and the second metal layer to a gap measured horizontally between an edge of the region where the second gate electrode and the second device region overlap each other and the peripheral part of the second metal layer is 0.32 or less than 0.32.